



Factors affecting on Knowledge of beneficiary Farmers about Project on Climate Resilient Agriculture

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Abstract— The study was carried out in two tahsils of Yavatmal district i.e., Darwha and Ner of Maharashtra state with the objective to study the knowledge about project on climate resilient agriculture (PoCRA) among the beneficiary and non-beneficiary farmers. For this study 60 PoCRA beneficiaries and 60 non-beneficiary farmers were selected on the basis of adoption of sprinkler irrigation system on subsidy. The data collected was analyzed and result of study revealed that (100%) of beneficiary farmers were belongs to high level of knowledge of sprinkler irrigation system under PoCRA Project. In case of non-beneficiary farmers, (63.33%) majority of farmers found to have medium level of knowledge about the sprinkler irrigation system, followed by (36.67%) of them having high level of knowledge whereas none of them was found in low level of knowledge.



Keywords— Climate Resilient, PoCRA project, Knowledge, Beneficiaries

I. INTRODUCTION

Agriculture is the back-bone sector of Indian economy and is largely depends on climate. Climate change poses a risk to the livelihoods of rural communities by negatively impacting agricultural output and raising production costs. Under such conditions, it is essential that the farmers be kept abreast of this dynamic agricultural through an equally dynamic system of extension education and also according to a report by Central Research Institute of Dryland Agriculture (CRIDA), Hyderabad the climate change also has an impact on Indian agriculture which results in a GDP loss of 1.5 per cent annually. Climate is constantly varying, on time scales that range from seasons to the lifetime of the Earth. We recently see effect of climate change then questions are arising in front of us that, what can we do for this? Then we move towards the technology. What kinds of Agriculture technology help us to conserve our atmosphere, our earth, and at last our life also? Climate resilient technologies are promising tool to guard a climate system from climatic variations.

In order to find out permanent solution to these changes in climate, Indian Council of Agricultural Research

(ICAR) initiated National Initiative for Climate Resilient Agriculture (NICRA) to promote climate resilient practices over these climate change affected places.

The Project on Climate Resilient Agriculture (PoCRA) was conceptualised by the Department of Agriculture, Government of Maharashtra and the World Bank to develop a drought-proofing and climate-resilient strategy for the agriculture sector as a long-term and sustainable measure, to address the likely impacts of climate variabilities and climate change. The main purpose of this study was to get a clear-cut picture of the present situation of the knowledge of sprinkler irrigation system in Vidarbha region of Maharashtra especially in Yavatmal district with following objective: to find out the extent of knowledge of the farmers about sprinkler irrigation system, and to ascertain the association between the selected characteristics of the famers and their extent of knowledge of sprinkler irrigation system.

II. MATERIALS AND METHODS

For the present study, two talukas of Yavatmal

district i.e. Darwha and Ner were selected on the basis of highest number of villages under PoCRA Project. From these tahsil 60 beneficiaries and 60 non beneficiaries were selected purposively who adopted sprinkler irrigation system. Ex-post Facto research design was used for the study. The primary data were collected using both structured and semi-structured interview schedule and focus group discussion was also conducted to collect qualitative data from the farmers. The quantitative data were analyzed using statistical tools like percentage, frequency, coefficient of correlation were used to analyze the farmers' responses to interpret and draw meaningful result.

III. RESULTS AND DISCUSSION

1. Profile of beneficiary and non-beneficiary farmers

The data related to profile of beneficiary and non-beneficiary farmers, reported that, more than half (53.33%) of beneficiary farmers belonged to middle age group i.e., 36 to 50 years of age, followed by old age i.e., above 50 years of age to the extent of 26.67 per cent. Remaining 20.00 per cent of beneficiary farmers were in the young age category i.e., 18 to 35 years. Regarding non-beneficiary farmers more than half (55.00%) of the farmers were belonged in middle age group i.e., 36 to 50 years of age group, followed by old age group i.e., above 50 years to extent of 30.00 per cent. Remaining 15.00 per cent of non-beneficiary farmers were in young age category i.e., 18 to 35 years. In case of education, 35.00 per cent of beneficiary farmers were educated up to higher secondary school level, followed by 26.67 per cent beneficiary farmers educated up to secondary school, 16.67 per cent educated up to college and 11.67 per cent of beneficiary farmers educated up to primary school. The remaining beneficiary farmers educated up to middle school level 8.33% and very few 03.33% per cent were found illiterate. In case of land holding, it was observed from 83.33 per cent beneficiary farmers possess semi land holding i.e., 1.01 - 2.00 ha, followed by 16.67 per cent possess marginal land holding i.e., below 01.00 ha, and None of the beneficiary farmer was found to be in semi-medium land, medium and large category of land holding i.e., 02.00 to 04.00 ha, 04.01-10.00 ha and above 10.00ha. respectively. Regarding the non-beneficiary farmers, 81.33 per cent of them possess small land holding i.e., 1.01 - 2.00 ha, followed by 18.33 per cent beneficiary farmers possess marginal land holding i.e., below 1.00 ha, None of the Non-beneficiary farmer was found to be in semi-medium land, medium and large category of land holding i.e., 02.00 to 04.00 ha, 04.01-10.00 ha and above 10.00 ha., respectively. It is revealed that, 50.00 per cent beneficiary farmers possess medium land holding i.e., 2.51 - 4.50, followed by 33.33 per cent possess large land holding i.e., above 04.50,

and 16.67 per cent beneficiary farmer was found to be in small land holding. Regarding the non-beneficiary farmers, 61.67 per cent non-beneficiary farmers possess medium land holding i.e., 2.51 - 4.50, followed by 20.00 per cent possess large land holding i.e., above 04.50, and 18.33 per cent beneficiary farmer was found to be in small land holding. Further, it is evident that, 56.67 per cent of beneficiary farmers were having small family size having up to 4 members, followed by 36.67 per cent of respondents possessed medium family size i.e., 5 to 8 members, remaining 6.66 per cent of respondents were having large family size i.e., above 8 members. Regarding non-beneficiary farmers, 66.67 per cent were having small family size having up to 4 members, followed by 30.00 per cent of respondents possessed medium family size i.e., 5 to 8 members, remaining 03.33 per cent of respondents were having large family size i.e., above 8 members. It was, therefore, concluded that more than fifty per cent of respondents had small family size i.e., up to 4 members. It is revealed that, 66.67 per cent of the Beneficiary respondents had annual income between Rs. 50,001 to 1,00,000/-, Followed by the 18.33 per cent farmers possesses annual income up to 50,000/- And 15.00 per cent of the beneficiary farmer was found to be above Rs. 1,00,000/-. Regarding the non-beneficiary respondent, 60.00 per cent of the non-beneficiary respondents had annual income between Rs. 50,001 to 1,00,000/-, followed by the 35.00 per cent farmers possesses annual income up to 50,000/- And only 5.00 per cent of the non-beneficiary farmer was found to be above Rs. 1,00,000/-. Therefore, it could be concluded that, majority of beneficiary and non-beneficiary respondents had medium category of annual income between Rs 50,001 to Rs. 1,00,000/-. It is observed that, 65.00 per cent of beneficiary farmers were found to be in medium level of farming experience i.e., 13 to 24 years, followed by low level of farming experience i.e., up to 12 years 11.67 per cent and same 23.33 per cent of beneficiary farmers having high farming experience above 25 years. In case of non-beneficiary farmers, 60.00 per cent of them having medium level of farming experience i.e., 13 to 24 years, followed by low level of farming experience i.e., up to 12 years 20.00 per cent and only 20.00 per cent of non-beneficiary farmers having high farming experience. Thus, it could be concluded that the majority of beneficiary and non-beneficiary had medium level of farming experience. It could be seen that, 66.67 per cent of beneficiary farmers had medium level of extension contact, followed by 23.33 per cent farmers had high level of extension contact and only 10.00 per cent of beneficiary farmers had low level of extension contact. In case of non-beneficiary farmers, 61.67 per cent of non-beneficiary farmers had medium level of extension contact, followed by 35.00 per cent farmers had

low level of extension contact and only 03.33 per cent of non-beneficiary farmers had low level of extension contact. It could be concluded that, most of the beneficiary and non-beneficiary farmers had medium level of extension contact. It could be seen that, more than half i.e., 80.00 per cent of beneficiary farmers having medium level of economic motivation, it was followed by high 18.33 per cent level of economic motivation and 01.67 per cent beneficiary farmers having low level of economic motivation. In case of non-beneficiary farmers, 65.00 per cent of farmers having low level of economic motivation, followed by medium 31.67 per cent level of economic motivation and only 03.33 per cent of non-beneficiary farmers found in high level of economic motivation. It could be concluded that, majority of beneficiary and non-beneficiary farmers had medium level of economic motivation. It could be seen that, more than half i.e., 65.00 per cent of beneficiary farmers having high level of attitude, it was followed by medium (35.00%) level of attitude and none of the beneficiary farmers having low level of attitude towards PoCRA technology. In case of non-beneficiary farmers, 68.33 per cent of farmers having medium level of attitude, followed by low 30.00 per cent level of attitude and only 01.67 per cent of non-beneficiary farmers found in high level of attitude. It could be concluded that, majority of beneficiary had high level of attitude and non-beneficiary farmers had medium level of attitude toward PoCRA technology. It could be seen that, 73.33 per cent of beneficiary farmers having medium level of risk orientation, followed by high level of risk orientation to the extent of 26.67 per cent. None of beneficiary farmers belonged to low level of risk orientation. In case of non-beneficiary farmers, 51.67 per cent of farmers found in medium level of risk orientation, followed by low level of risk orientation of non-beneficiaries to the extent of 48.33 per cent and none of non-beneficiary farmers belonged to high level of risk orientation. Further more than half i.e., 65.00 per cent of beneficiary farmers having high level of innovativeness, it was followed by medium (35.00%) level of innovativeness and none of the beneficiary farmers having low level of innovativeness towards PoCRA technology. In case of non-beneficiary farmers, 53.33 per cent of farmers having medium level of innovativeness,

followed by low 46.67 per cent level of innovativeness and none of non-beneficiary farmers found in high level of innovativeness towards PoCRA technology.

2. Change in knowledge

Distribution of the beneficiary and non-beneficiary farmers according to frequency wise knowledge about sprinkler irrigation system has been furnished in Table 1 and Distribution of the beneficiary and non-beneficiary farmers according to their knowledge level about PoCRA project sprinkler technology has been furnished in Table 2.

It is evident from Table 1 that, in case of beneficiary farmers majority of farmers had knowledge subsidy structure under PoCRA (96.67), followed by sprinkler irrigation system saved water (96.67), type of soil suitable for sprinkler irrigation system (91.67), type of water cannot be use for sprinkler irrigation (91.67), labour requirements for the sprinkler system is less as compare to traditional method (90.00), sprinkler irrigation system depends on the topography of land (88.33), pumping system for sprinkler irrigation (85.00), irrigation scheme under PoCRA Project (83.33), area covered by single nozzle (76.67), spacing between two sprinklers (71.67), different components of sprinkler irrigation system (70.00), Very less number of beneficiary farmers had knowledge of cleaning with Acid treatment (60.00).

In case of non-beneficiary farmers, majority of farmers had knowledge of crops for which sprinkler irrigation system is suitable (98.33), followed by sprinkler irrigation system saved water (70.00), type of soil suitable for sprinkler irrigation system (66.67), sprinkler irrigation system depends on the topography of land (65.00), spacing between two sprinklers (63.33), type of water cannot be use for sprinkler irrigation (60.00), pumping system for sprinkler irrigation (56.67), area covered by single nozzle (56.67), whereas less than fifty per cent of non-beneficiary had knowledge about subsidy structure under PoCRA (46.67), different components of sprinkler irrigation system (40.00), labour requirements for the sprinkler system is less as compare to traditional method (33.33), Very small number of non-beneficiary farmers had knowledge of cleaning with Acid treatment (23.33).

Table 1. Distribution of the beneficiary and non-beneficiary PoCRA farmers according to frequency wise knowledge about sprinkler irrigation system

Sr. No.	Statements	Beneficiary farmers n=60		Non-beneficiary farmers n=60	
		Yes	No	Yes	No
1	The subsidy structure under PoCRA project for sprinkler system	58 (96.67)	02 (03.33)	28 (46.67)	32 (53.33)
2	Any two crops for which sprinkler irrigation system is suitable	60 (100.00)	00 (00.00)	59 (98.33)	01 (01.67)
3	Name different components of sprinkler irrigation system	42 (70.00)	18 (30.00)	24 (40.00)	36 (60.00)
4	Amount of water can be saved by sprinkler irrigation system	58 (96.67)	02 (03.33)	42 (70.00)	18 (30.00)
5	The area covered by single nozzle	46 (76.67)	14 (23.33)	34 (56.67)	26 (43.33)
6	Sprinkler irrigation system suitable for which type of soil	55 (91.67)	05 (08.33)	40 (66.67)	20 (33.33)
7	Water cannot be use under sprinkler irrigation	55 (91.67)	05 (08.33)	36 (60.00)	24 (40.00)
8	The use of sprinkler irrigation system depends on the topography of field	53 (88.33)	07 (11.67)	39 (65.00)	21 (35.00)
9	Spacing between two sprinklers	43 (71.67)	17 (28.33)	38 (63.33)	22 (36.67)
10	Name the pumping system use for sprinkler irrigation	51 (85.00)	09 (15.00)	34 (56.67)	26 (43.33)
11	Sprinkler irrigation system clean with Acid Treatment	36 (60.00)	24 (40.00)	14 (23.33)	46 (76.67)
12	The labour requirements for the sprinkler system are less as compare to traditional method	54 (90.00)	06 (10.00)	20 (33.33)	40 (66.67)

Table 2. Distribution of beneficiary and non-beneficiary PoCRA farmers according to their knowledge level about PoCRA project sprinkler technology

Sr. No.	Category	Beneficiary farmers (n=60)		Non-beneficiary farmers (n=60)	
		Frequency	Per cent	Frequency	Per cent
1	Low (Up to 33.33)	00	00.00	00	00.00
2	Medium (33.33 to 66.66)	00	00.00	38	63.33
3	High (Above 66.67)	60	100.00	22	36.67
	Total	60	100.00	60	100.00

Data with regards to the level of knowledge possessed by the beneficiary and non-beneficiary PoCRA farmers have been furnished in Table 2. It indicated that, 100.00 per cent of beneficiary farmers found to have high knowledge level about sprinkler irrigation system. No one beneficiary farmer was found in both medium and low knowledge level. In case of non-beneficiary farmers, 63.33 per cent of them found to have medium level of knowledge about sprinkler irrigation system, followed by 36.67 per cent of them having high level of knowledge whereas, none of them was found in low level of knowledge. It could be inferred from Table 2 that majority of beneficiary farmers were found in high level of knowledge whereas non-beneficiary farmers in medium level of knowledge.

Table 3. Coefficient of correlation between selected characteristics of beneficiary and non- beneficiary PoCRA farmers with their knowledge

Sr. No.	Characteristics	'r' value	
		Beneficiary farmers n=60	Non beneficiary farmers n=60
1	Age	0.062NS	0.065NS
2	Education	0.306*	0.130NS
3	Family size	0.291*	0.233NS
4	Land holding	0.219NS	0.360**
5	Annual income	0.398**	0.382**
6	Farming experience	0.275*	0.179NS
7	Extension contact	0.337**	0.477**
8	Economic motivation	0.404**	0.391**
9	Attitude	0.303*	0.193NS
10	Risk Orientation	-0.114NS	0.063NS
11	Innovativeness	0.381**	0.365**

**Significant of 0.01 level of probability

NS – Non-Significant

*Significant of 0.05 level of probability

It was noted from the Table 3 that, in case of beneficiary farmers annual income, extension contact, economic motivation and innovativeness were found to be positive and highly significant with knowledge at 0.01 level of probability, whereas education, family size, farming experience and attitude were found to be positively significant at 0.05 level of probability. Whereas, age, land holding, family size and risk orientation were found non significantly correlated with knowledge. In case of non-beneficiary farmers, it could be seen that land holding, annual income, extension contact, economic motivation and innovativeness were found to be positive and highly significant with knowledge at 0.01 level of probability. No

3. Relation analysis

The coefficient of correlation between the selected characteristics of beneficiary and non-beneficiary farmers with the knowledge dimension has been presented in this section.

Coefficient of correlation between selected characteristics of beneficiary and non- beneficiary PoCRA farmers with their knowledge

The coefficients of correlation between selected characteristics of beneficiary and non-beneficiary farmers have been presented in Table 3.

one was found to be positively significant at 0.05 level of probability. Whereas, age, education, family size, farming experience, attitude and risk orientation were found non significantly correlated with knowledge.

4. CONCLUSION

Climate change is likely to affect all the natural ecosystems as well as socio-economic conditions of the farmers. Cent percent beneficiary farmers have the full knowledge of sprinkler irrigation system under PoCRA Project, however 63.33 percent of non-beneficiary farmers have medium level of knowledge about the sprinkler irrigation system. In terms of correlation, it can be

concluded that, in case of beneficiary farmers annual income, extension contact, economic motivation and innovativeness were found to be positive and highly significant with knowledge at 0.01 level of probability. Whereas, education, family size, farming experience and attitude were found to be positively significant at 0.05 level of probability. Whereas, in case of non-beneficiary farmers, it could be seen that land holding, annual income, extension contact, economic motivation and innovativeness were found to be positive and highly significant with knowledge at 0.01 level of probability. It is therefore important that all the factors influencing farmer's perception be taken into consideration to improve their perception as these factors further influence the field level adaptation strategies to combat vagaries of climate change in agriculture.

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